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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/843,936	04/27/2001	Peter Jeremy Dodd	697.024US1	8635

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EXAMINER
LEUNG, JENNIFER A

ART UNIT	PAPER NUMBER
1764	

DATE MAILED: 09/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Advisory Action	Application No.	Applicant(s)	
	09/843,936	DODD ET AL.	
	Examiner	Art Unit	
	Jennifer A. Leung	1764	

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 05 September 2003 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE. Therefore, further action by the applicant is required to avoid abandonment of this application. A proper reply to a final rejection under 37 CFR 1.113 may only be either: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114.

PERIOD FOR REPLY [check either a) or b)]

a) ☒ The period for reply expires *4* months from the mailing date of the final rejection.

b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.
ONLY CHECK THIS BOX WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

1. ☐ A Notice of Appeal was filed on _____. Appellant's Brief must be filed within the period set forth in 37 CFR 1.192(a), or any extension thereof (37 CFR 1.191(d)), to avoid dismissal of the appeal.

2. ☐ The proposed amendment(s) will not be entered because:

   (a) ☐ they raise new issues that would require further consideration and/or search (see NOTE below);

   (b) ☐ they raise the issue of new matter (see Note below);

   (c) ☐ they are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or

   (d) ☐ they present additional claims without canceling a corresponding number of finally rejected claims.

   NOTE: _____.

3. ☐ Applicant's reply has overcome the following rejection(s): _____.

4. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).

5. ☒ The a)☐ affidavit, b)☐ exhibit, or c)☒ request for reconsideration has been considered but does NOT place the application in condition for allowance because: *See Continuation Sheet*.

6. ☐ The affidavit or exhibit will NOT be considered because it is not directed SOLELY to issues which were newly raised by the Examiner in the final rejection.

7. ☒ For purposes of Appeal, ~~the proposed amendment(s) a)☐ will not be entered or b)☐ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.~~

   The status of the claim(s) is (or will be) as follows:

   Claim(s) allowed: _____.

   Claim(s) objected to: _____.

   Claim(s) rejected: *31 and 35-40*.

   Claim(s) withdrawn from consideration: _____.

8. ☒ The proposed drawing correction filed on *05 September 2003* is a)☒ approved or b)☐ disapproved by the Examiner.

9. ☐ Note the attached Information Disclosure Statement(s)(PTO-1449) Paper No(s). _____.

10. ☐ Other: _____

HIEN TRAN
PRIMARY EXAMINER

CONTINUATION OF SECTION 5.

Regarding the rejection of claims 31 and 35-39 under 35 U.S.C. 103(a) as being unpatentable over Eliasson et al. in view of Takahashi, as set forth in the Final Office Action, applicant traverses the rejection and asserts the following:

> "Applicant strongly objects to the Examiner indicating it would be obvious to replace consumption unit **8** with the reforming reactor arrangement of Takahashi in a plant environment. The unit in Takahashi is in a car and thus not analogous to a power plant. Furthermore, if Takahashi is used in a vehicle as suggested, it would be impossible to recycle the carbon dioxide. Instead, the carbon dioxide would be discharged to the atmosphere as specifically taught by Takahashi." (page 10, third paragraph).
>
> "... even if these two references are combined, no means for recycling is disclosed in the combination. More specifically, no means for recycling from a second reactor to a first reactor is shown nor suggested. That is, even if the concept of recycling carbon dioxide is known as the Examiner suggests, the prior art still would not anticipate or render obvious specifically recycling carbon dioxide from a second reactor to a first reactor as claimed in claim 31." (page 10, fourth paragraph).

In response to applicant's argument that the arrangement of Takahashi, for use in a car, is nonanalogous art to the arrangement of Eliasson, for use in a power plant, the examiner contends that despite the suggested intended use in a car versus a power plant arrangement, the prior art references are indeed within the same field endeavor, as well as pertinent to the particular problem with which applicant's invention is concerned. The Eliasson et al. reference, for example, relates to the technical problem of storing hydrogen and seeks to solve the problem by storing hydrogen in the form of methanol, since methanol is a liquid under atmospheric pressure and the usual conditions, and has about twice as much energy content as liquid hydrogen (sections [0005]-[0007]). Similarly, the Takahashi reference relates to the reforming of methanol to produce hydrogen for powering a vehicle, wherein methanol is selected because it remains

liquid under ordinary temperature and pressure and is thus excellent for storage and transportation (column 1, lines 8-17; column 3, lines 49-54). Additionally, the Eliasson et al. reference expressly suggests that the particular arrangement is applicable for use in an automobile environment, namely "the acquired methanol... can be supplied to the consumption object **8**, for example, vehicles," as stated in section [0015]. Also, the examiner disagrees with applicant's argument that Eliasson et al. only allows for "a power plant" or "plant environment" arrangement, since the reference additionally states, "carbon dioxide from the exhaust gas of fossil fuel combustion energy generation equipment is used preferably," (section [0006]), which would suggest to one having ordinary skill in the art that any fossil fuel combustion energy generation equipment may be utilized, with no indication or limitation to a particular type of arrangement (i.e., a stationary plant arrangement versus a mobile arrangement).

In response to applicant's argument that it would be impossible to incorporate a carbon dioxide recycle from an automobile (i.e., being mobile) to a power plant (i.e., being stationary), and that a carbon dioxide recycle from the second reactor to the first reactor is not expressly suggested or shown in any one or all of the references, the examiner contends that the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). In the instant case, key teachings to be gleaned from Eliasson et al. and Takahashi are, 1) the storage of hydrogen in the form of methanol is preferred due to the ease of handling and transport as well as its higher energy content in stored form, and

2) the reaction of carbon dioxide and hydrogen is a means for producing said methanol. Also, as taught by Takahashi, "a reforming reactor has been conventionally used for recovering hydrogen from a material gas containing a hydrocarbon such as methane and/or a hydrocarbon containing oxygen such as ethanol." (column 1, lines 18-25).

Furthermore, the examiner maintains that it would have been obvious for one of ordinary skill in the art at the time the invention was made to provide a recycle for the carbon dioxide gas exhausted by the reformer **11** (or second reactor) of Takahashi to the first reactor **4** of Eliasson et al. (which consumes carbon dioxide gas), in order to conserve consumed resources and limit the release of carbon dioxide into the environment, both concepts being well known in the art. For instance, Eliasson et al. specifically disclose the importance of, "decreasing all the burst sizes of a carbon dioxide" to minimize the serious weather changes produced by the greenhouse effect, and further suggests the conservation of consumed resources by the utilization of carbon dioxide obtained from one combustion process to another (sections [0002], [0005], [0008]). Such teachings would have taught one having ordinary skill in the art that not only is carbon dioxide a consumed reagent, but the release of carbon dioxide to the atmosphere should be minimized. The provision of a closed-system to the modified apparatus of Eliasson et al. in order to conserve consumed resources as well as prevent harm to the environment would have thus been obvious.

Regarding claim 36, applicant further asserts,

> "If methanol is used as fuel or is burned as suggested by Eliasson, no hydrogen is produced. Rather, a combustion of methanol produces water. Therefore, with these limitations, there is considered to be another indicia of non-obviousness to combine the Takahashi and Eliasson references." (page 11, first paragraph).

However, note that upon combination of the references, the provision of the reformer **11** of Takahashi for the second reactor **8** of Eliasson et al. would have allowed methanol fuel to be reformed, thereby producing not combustion gases and water, but hydrogen gas and carbon dioxide, of which hydrogen is used for powering the fuel cell/generator **16**, as taught by Takahashi.

Finally, regarding the rejection of claim 40 under 35 U.S.C. 103(a) as being unpatentable over Eliasson et al. in view of Takahashi, as applied to claim 31, and further in view of Degnen, Jr. et al., as set forth in the Final Office Action, applicant traverses the rejection and asserts,

> "It is unclear why it would be obvious to first convert a power plant by adding a reactor and fuel cell of a car and then add an additional internal combustion engine. There is simply no suggestion in the base references that hydrogen itself could be used as a fuel." (page 11, second paragraph).

However, claim 40 depends on independent claim 31, and therefore does not further recite a fuel cell, which is separately claimed in claim 37, rendering applicant's argument moot.

Hien Tran

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Jennifer A. Leung
September 15, 2003